

Land system regime shifts and their impacts on human wellbeing in forest frontier landscapes of Madagascar and Myanmar

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Julie G. Zähringer

@julie_gwen

julie.zaehringer@cde.unibe.ch

Jorge Llopis, Katharina Nydegger, Clara Diebold, Flurina Schneider



Swiss Programme for Research
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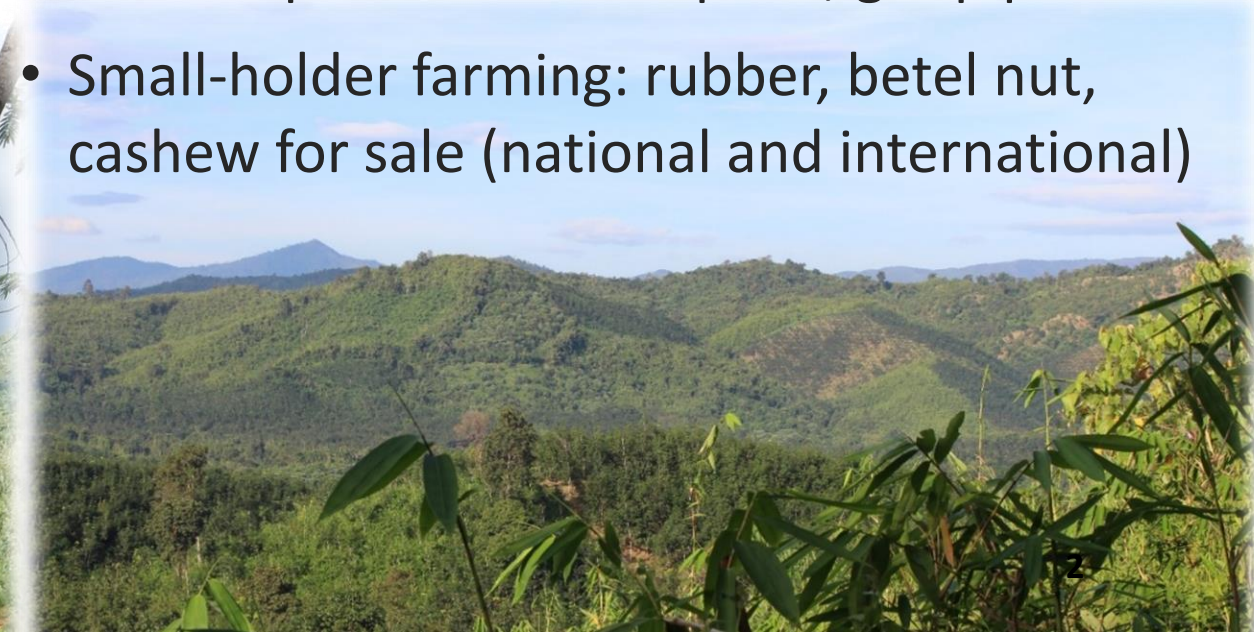
Context: Madagascar and Myanmar study regions

Northeastern Madagascar: Analanjirofo Region

- Biodiversity hotspot (Masoala / Makira PAs)
- Extremely remote (lack of infrastructure)
- Small-holder farming: rice for subsistence (shifting cult. and irrigated), clove and vanilla (agroforestry) for sale (international)

Southern Myanmar: Tanintharyi Region

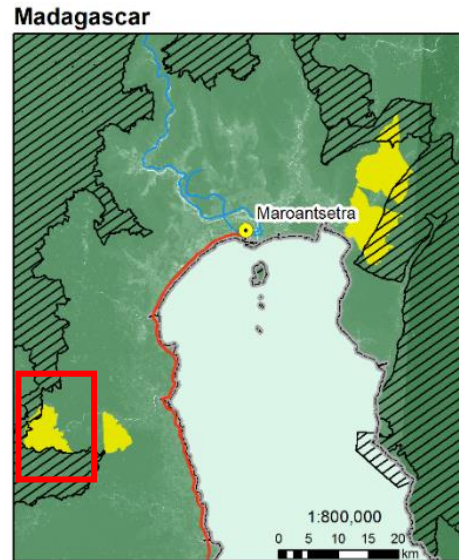
- Biodiversity hotspot (TNR)
- Civil war between Military Government and KNU (ca. 50 years long, ceasefire 2012)
- Land acquisitions for oil palm, gas pipelines
- Small-holder farming: rubber, betel nut, cashew for sale (national and international)



Methodological approach: case study landscapes

Northeastern Madagascar

1 village (only for this presentation, else 4) and surrounding land use



Southern Myanmar

2 villages and surrounding land use

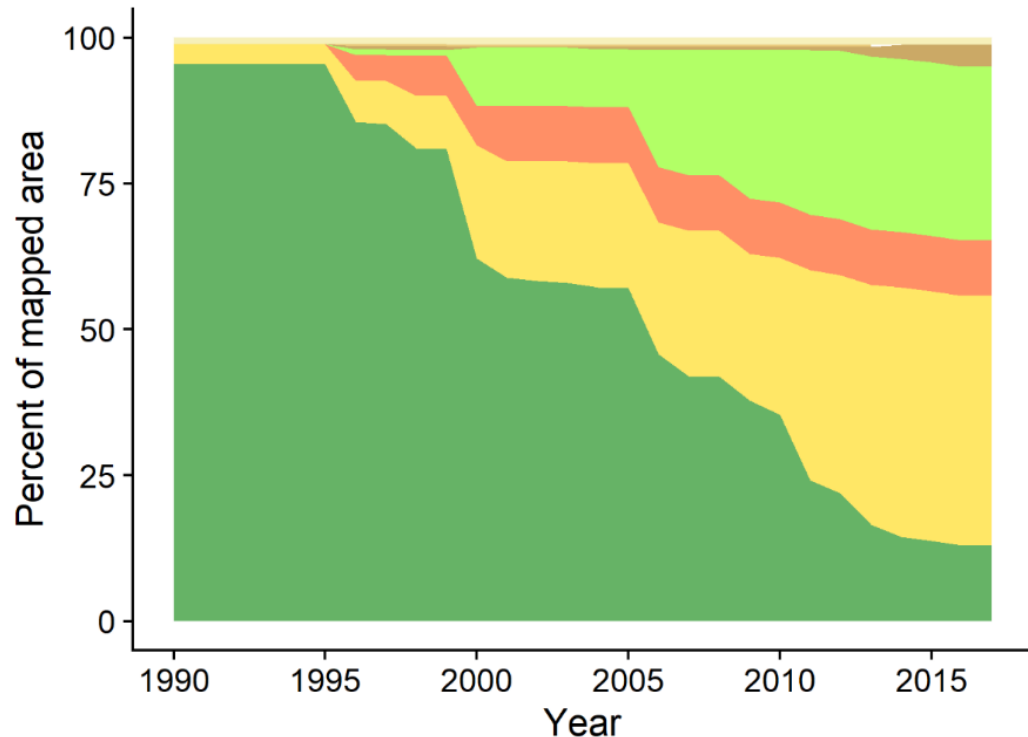


Empirical data collection in each case study landscape:

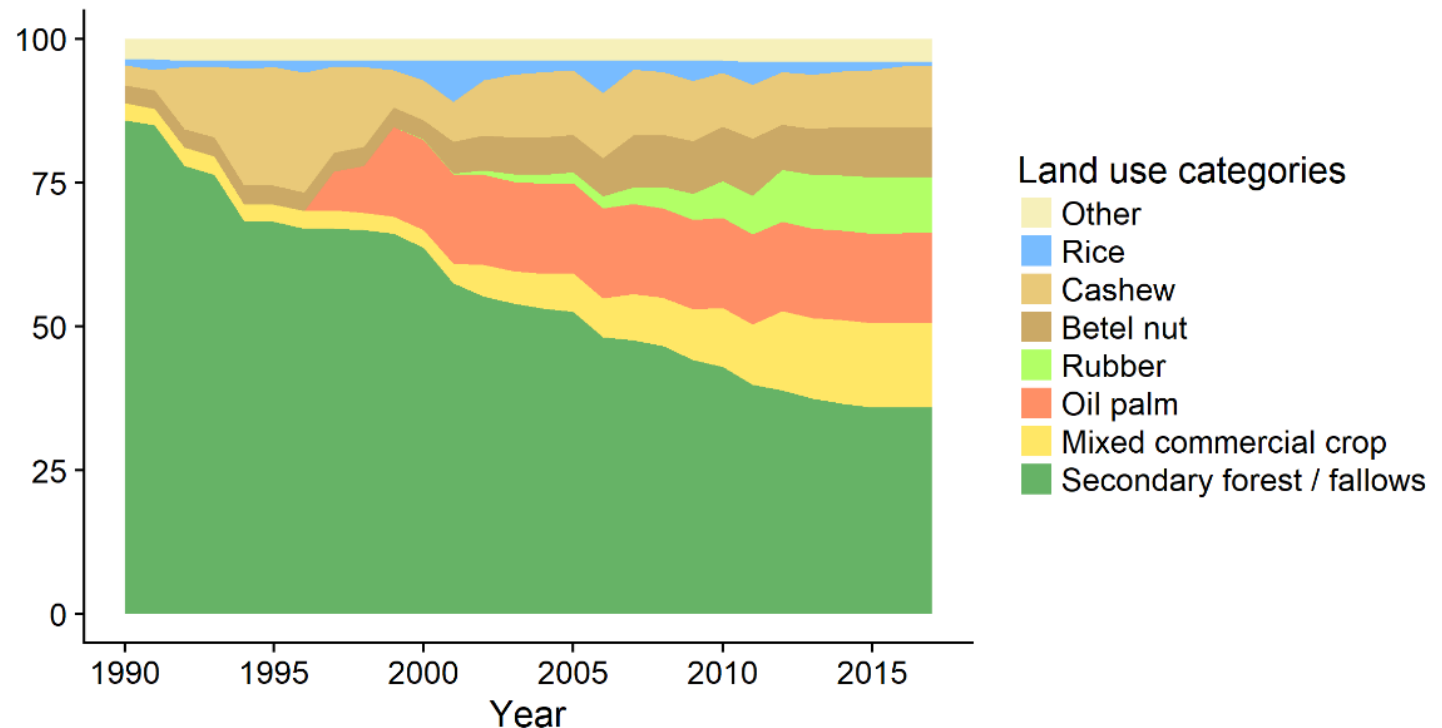
- 1) Participatory mapping of VHR land use change for each year between 1990 and 2017
- 2) Two focus groups (male and female) on human wellbeing
- 3) Semi-structured qualitative wellbeing interviews (male and female)

Land system regime shifts - Myanmar

**Village 1, 15 km²
1990-2017**



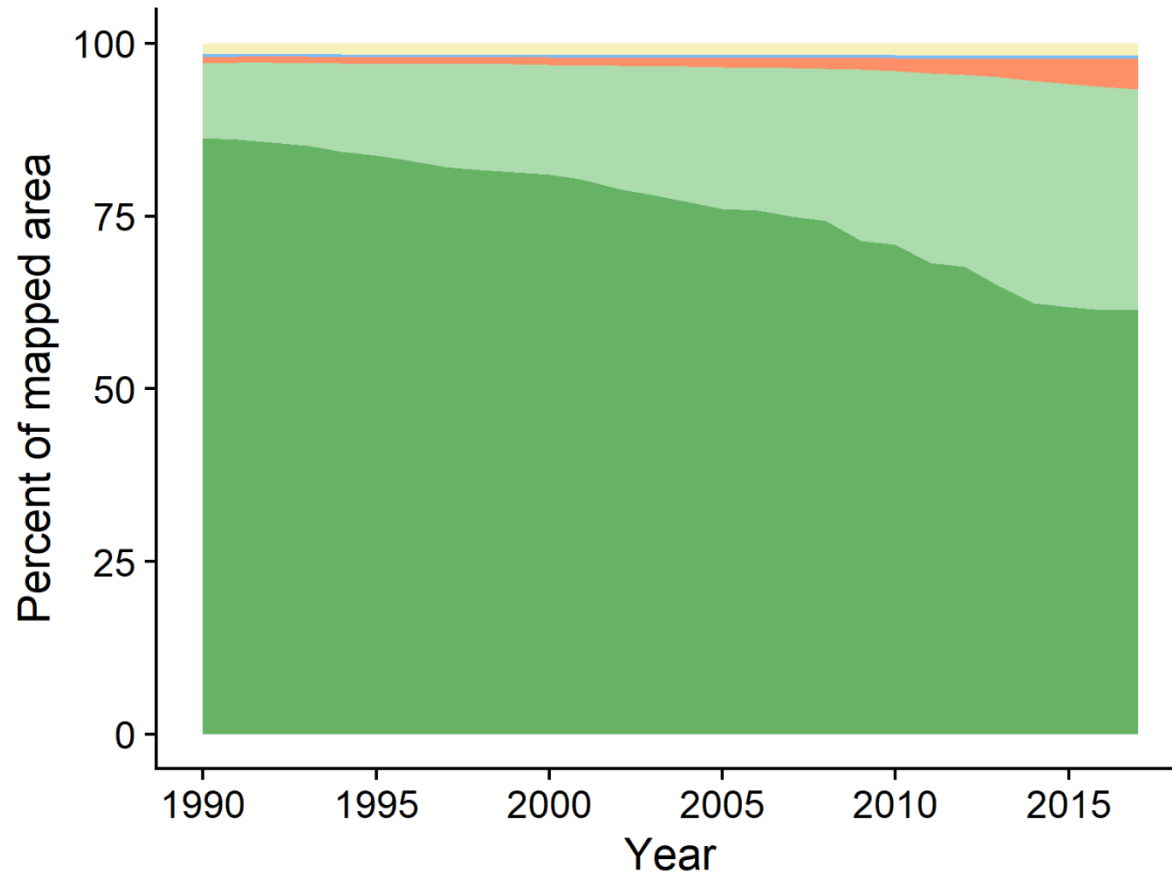
**Village 2, 70 km²
1990-2017**



- Decrease of secondary forest / fallow
- Decrease of shifting cultivation for subsistence rice production
- Expansion of cash crops (mainly rubber, oil palm, betel, cashew)

Land system regime shifts - Madagascar

Madagascar (Village 1), 38 km²



Llopis et al. (In preparation).

Land use categories

- Other
- Irrigated rice
- Clove and vanilla agroforest
- Shifting cultivation
- Forest

- Decrease of forest
- Expansion of shifting cultivation
- Expansion of cash crops and irrigated rice

Zaehring et al. (2018). A novel participatory and remote-sensing-based approach [...]. [Journal of Land Use Science](#).

Operationalization of “Central Human Capabilities” (Nussbaum 2007)

- **Life** (not dying prematurely)
- **Bodily Health** (good health, nourishment, shelter)
- **Bodily Integrity** (move freely, secure against violence)
- **Senses, Imagination, and Thought** (think and speak freely, get education and training, practice religious believes)
- **Emotions** (express emotions, be free of fear and anxiety)
- **Practical Reason** (form a conception of the good, critical reflection about one's life)
- **Affiliation** (good relationships, social interaction, be respected as a person)
- **Other Species** (live with concern for and in relation with animals, plants, nature)
- **Play** (laugh, play, enjoy recreational activities)
- **Control over one's Environment** (political participation, hold property, have property rights, possibility of employment)



Madagascar



Myanmar

Changes in "Bodily Health" (last 20 years)

Madagascar (n=20)

Health:

- Better access to health services at village level
- More expensive to be cured (pharmaceuticals vs. medicinal plants)
- **More diseases (mainly Malaria)**

Food:

- **Less subsistence rice (decreased availability of land and fertility) → can mostly be compensated through money from cash crops**
- More subsistence rice (more labour and less pests)
- **Less water in rivers → irrigated rice production more difficult**

Myanmar (n=52)

Health:

- Better access to health services (Government, TOTAL company CSR)
- Better knowledge about Malaria prevention due to awareness raising
- **Decreased use of medicinal plants**

Food:

- Better access to food
- **Lower quality food consumed**

Legend:

Green: aspect has improved

Red: aspect has worsened

Bold: change can be linked to the land system regime shifts described

Changes in "Bodily Integrity" (last 20 years)

Madagascar (n=20)

Free movement:

- Better means of transportation → cash crop buyers come to village
- Reduced ability to move freely due to bandits

Security:

- Increased criminality (due to increase of vanilla prices)

"Today, if we earn money we don't sleep; we are afraid to be killed. That's why I say it's no longer safe"

Myanmar (n=52)

Free movement:

- Improved road conditions
- No more restrictions through war parties

Security:

- General security increased after end of civil war (in Village 2, gas and palm oil companies worsened situation during civil war)

Changes in "Other Species" (last 20 years)

Madagascar (n=20)

- Better care for environment (cleaning in village, planting flowers etc.) (women's perception)
- **Decrease of forest has negative consequences (reduced water supply, temperature increase, less construction wood)**

"Before, when the kids crossed the river, which passes through the village, they had to take off their clothes and tiptoe because there was so much water. But now even small kids can cross the river."

Myanmar (n=52)

- **Fewer natural water sources (due to forest degradation)** → mitigated through better access to water (pipes)
- **Decreased availability of forest products**
- **More heat periods**

"In the past I also got more fish and other animals from the forest. I think it is due to too much use that the situation of the forest became the way it is now."

Changes in "Senses, Imagination, Thought" (last 20 years)

Madagascar (n=20)

- **More children in school (change of values/attitude towards education and higher income from cash crops)**

"[...] Now there are more people who want to study, to gain knowledge, than before. Before the parents did not aim at educating their children much. Now parents wish to really educate their children. "

Myanmar (n=52)

- Better access to school after end of civil war and support from gas companies, government, NGOs
- More religious ceremonies (due to more freedom and better mobility)

Changes in "Control Over One's Environment" (last 20 years)

Madagascar (n=20)

Participation in decision-making:

- Increased strongly at village level (for women also at household level)

Market and land access:

- Higher incomes and more income sources
- Decreased access to land due to protected areas

"[...] I'm still young. Before, people could deforest but for us there is no more land to use. We don't know anymore what to do for a living."

- Strong overall increase of living costs (difficult if one does not have enough land for cash crops)
- Lack of trust in the government

Myanmar (n=52)

Participation in decision-making:

- More women involvement, freedom to speak

Market and land access:

- Better market (access, prices) for cash crops
- More infrastructure support from the government
- Lower cash crop production
- Large parts of land controlled by investors

"For me, in the past things were better. I used to grow a lot of rice. At that time, I did not have to buy the land, I could just grow the rice on every uncultivated land, but now I cannot do it like this anymore."

Changes in "Affiliation" (last 20 years)

Madagascar (n=20)

Social affairs:

- People are more sociable and can participate more in social events (higher income from cash crops)
- Decrease of solidarity/mutual help (due to increasing importance of money in the society)
- More conflicts regarding access to land

"Before, if there was someone with a problem, people helped each other e.g. for work in the fields or in the case of sickness. Today, the person who has a problem needs to manage on her own."

MSc Clara Diebold

Myanmar (n=52)

Social affairs:

- Improvement of social relations (better mobility and security)
 - No more forced labour
- "[...] In the past I was forced to work for government officials in construction work. This was still the case 3-4 years ago, and normally at least once a month. Nowadays it is voluntary work."*
- Relatives came back to village after end of civil war
 - Relatives migrate to Thailand due to lack of income opportunities

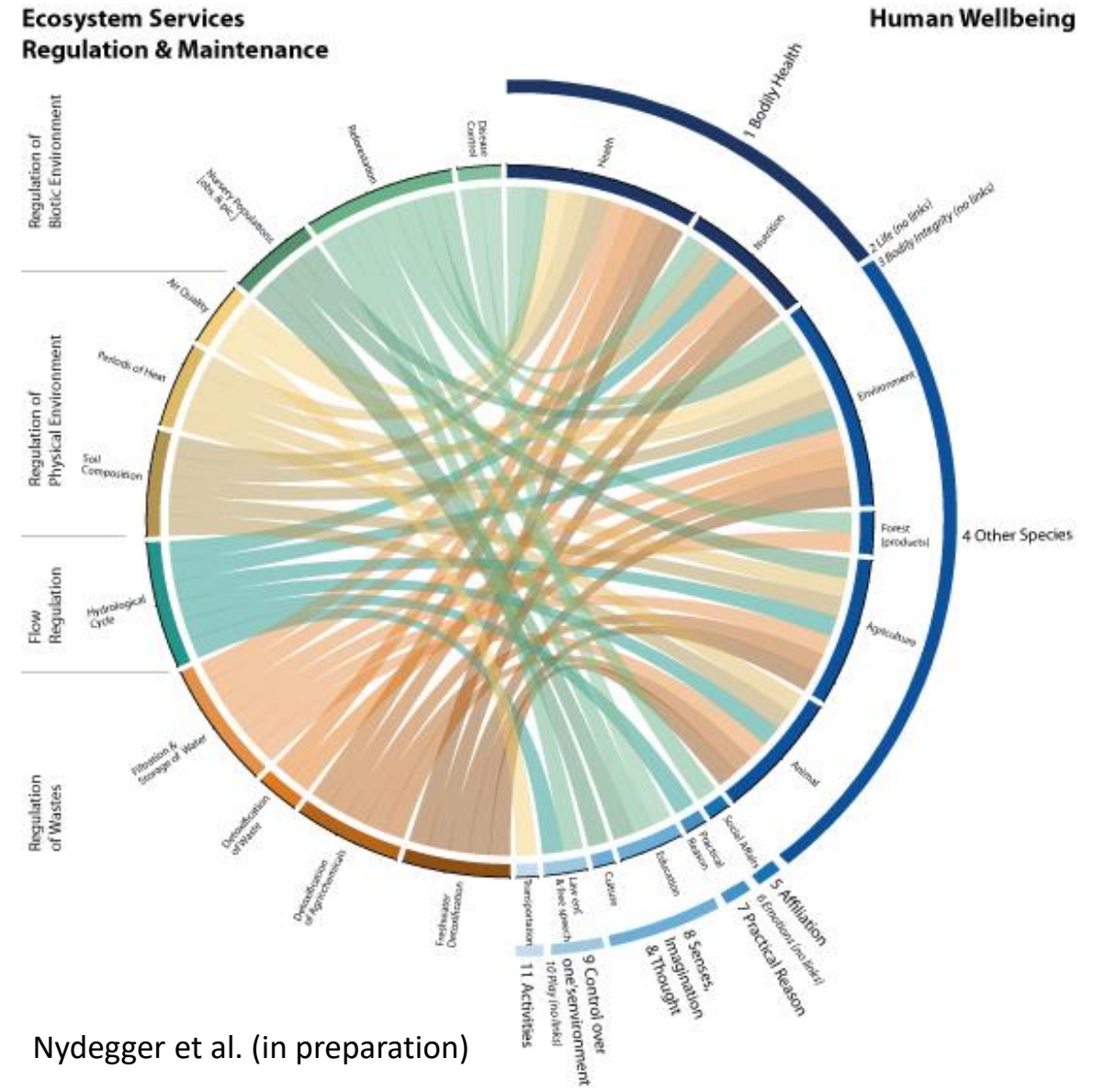
MSc Katharina Nydegger

Outlook: contributions of nature to wellbeing dimensions

Example: contribution of Regulating & Maintenance ecosystem services to wellbeing in Myanmar

Pending investigations:

- ❖ Disaggregated contributions of ES to wellbeing for different land users
- ❖ Change in ES contributions to WB over time




Nydegger et al. (in preparation)

Preliminary conclusions

- Land system regime shifts in forest frontier landscapes affect same wellbeing dimensions positively (through increased income) and negatively (e.g. land conflicts, security)
- Overall, wellbeing increased for many, mainly due to increased income from land and institutional changes (peace, health), **but not all**,...
- ... despite decreasing environmental quality (deforestation, reduced water quantity etc.)



Thank you for your attention!

Contact:  @julie_gwen, julie.zaehringer@cde.unibe.ch
@R4Telecoupling, www.telecoupling.unibe.ch

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- All participants of mapping workshops and transect walks, focus groups discussions, and interviews in Madagascar and Myanmar

References

- Nussbaum, M. (2007). Human rights and human capabilities. *Harv. Hum. Rts. J.*, 20, 21.
- Zaehringer et al. (2018). A novel participatory and remote-sensing-based approach to mapping annual land use change on forest frontiers in Laos, Myanmar, and Madagascar. *Journal of Land Use Science*.

All pictures taken by members of the r4d team.

Annex: Participatory mapping of land system regime shifts

5-step approach

- 1) Design of the land use categorization system
- 2) Object-based segmentation and visual interpretation of very-high resolution images
- 3) Village-level participatory mapping workshop
- 4) Field walks for enhanced spatialization
- 5) Data transfer into a geographic information system

Zaehringer et al. (2018). A novel participatory and remote-sensing-based approach to mapping annual land use change on forest frontiers in Laos, Myanmar, and Madagascar. [Journal of Land Use Science](#).